SCOWCROFT INDEPENDENT

BOMBER FORCE REVIEW

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Independent Bomber Force Review

I. Introduction

Whether the United States should retain enough modern, heavy bombers to support U.S. national security strategy is, foremost, a strategic choice. We believe strongly that the future of America's long-range bomber force should be decided fundamentally on the basis of what best serves the national defense. Unfortunately, the Department of Defense (DoD) has made this strategic choice on a de facto basis in light of short-term funding and force structure preferences. If this decision is allowed to stand, the end result will be a shift to a force structure that relies almost entirely on short-range air power.

Pentagon preferences for short-range instead of long-range air power raise a puzzling contradiction. The long-range bomber fleet is an element of the force structure that appears ideally suited to the demands of the new security environment and national military strategy. We also have a weapon system--the B-2--which is now in production and if produced in substantial quantities, could revitalize and sustain that force. Yet the DoD has consistently opposed continued B-2 production.

Our analysis addresses this contradiction to help the Congress make a vital decision over the future of the bomber force. We first examine the planned future of the bomber force, its role in supporting U.S. national security, and the revolutionary potential offered by the B-2. We then examine the sources of Pentagon opposition and how this opposition has manifested itself in the recent series of studies the DoD has put forth to the Congress. We then offer a set of recommendations regarding legislation.

II. The Future of the Bomber Force

To put the matter simply, under current plans the bomber has no future. A de facto strategic choice has been made to rest the future of American air power on short-range fighters. Unless immediate corrective action is taken, the long-range heavy bomber will gradually disappear as a meaningful element of America's armed forces.

The clearest evidence of the bomber fleet's condition is its size and age. Since the late 1950s, the general trend has been for U.S. force structure to shrink, with capability sustained or improved with advancing technology. But in recent years, bombers have been reduced more than any other major force element (such as army divisions, aircraft carriers, and USAF fighters). There were 360 active bombers in 1980. The force dropped to about 300 in 1990. Under current plans, the operational bomber force in the year 2001 will consist of 130 aircraft: 44 B-52s, 70 B-1Bs, and 16 B-2s.

Unlike the fighter force, bomber force shrinkage is not being offset by substantial deployments of new planes and new models. So as the fighter force is improved, bomber force capabilities will inevitably decline over the long-term. The average bomber is already roughly twice the age of the average fighter, and current USAF plans are to maintain the remaining B-52s in service until they are at least 60 years

old, and possibly as old as 100. We may soon be in the extraordinary circumstance where America's bombers will be older than America's oldest aircraft carriers.

The bomber's loss has been the fighter's gain. Although in Congressional testimony the distribution of Air Force procurement is frequently portrayed as a cycling among transports, bombers, and fighters, in reality fighters have consistently maintained a plurality of the budget, and will overwhelmingly dominate the budget over the next two decades.

Table 1: Approximate Share of USAF Procurement Budget

	Airlifters	Bombers	Fighters
1970s	<5%	5%	95%
1980s	10%	40%	50%
1990's	30%	35%	35%
2000-2020	<5%	< 5%	95%

A corresponding indicator of fighter dominance is the steadily growing ratio of fighters to bombers in the USAF operational inventory. This ratio increases from about 4-1 in the 1950s, to 6-1 in the 1970s, to 10-1 in the 1990s, and trending toward about 14-1 in the near future.

With rare exceptions, Air Force actions on existing bomber programs illustrate an underwhelming amount of concern about the bomber's future. The B-1B bomber, which entered service in 1986, was not used in the Gulf War because of conventional mission deficiencies. Moreover, its upgrade program has been so stretched out that a 20-year gap between deployment and conventional upgrade is entirely likely (leaving only 10 years of expected system life until planned retirement). The B-2 fleet, which had been planned for 132 aircraft as late as 1990, was capped at 20 planes in 1992, with little Air Force dissent. Even more remarkable, the Air Force has actively resisted efforts by Congress to authorize production of additional B-2s. USAF leaders have even gone so far as to exclude bombers from their "wish list" of desired but unbudgeted items supplied to Congress every year. In 1996, for example, the Air Force included requests for re-engining the RC-135 and the AWACS, and production of additional F-16 fighters, on the same wish list that omitted production of more B-2s.

The DoD has no plan to keep the bomber force viable in the long run. Every other major weapon system--fighter, submarine, destroyer, carrier, tank, etc.--has either a system in continuing production or a planned, programmed replacement. JSF will replace F-16. The New Attack Submarine will replace the Los Angeles (688) class attack submarine. But no new bomber model is planned in the numbers required to replace the B-52 or B-1B. The current, uncontested DoD plan will inexorably vitiate the bomber force through age, attrition, and obsolescence.

Furthermore, recent congressional testimony by Air Force Chief of Staff General Ronald Fogleman revealed that the Air Force has no plan for replacing the mission capabilities lost as the bomber force disintegrates. When questioned about bomber

replacement General Fogleman said, "between now and 2020, we have lots of things we're going to look at." But the General concurred that no replacement was actually in the Air Force plan--meaning no funding in either the Five Year Defense Plan (FYDP) or the Ten Year Plan. With no planned funding there will no more B-2s, and almost certainly no B-3.

In sum, all evidence indicates that bombers have no future:

- The bomber force structure has been cut disproportionately;
- budgetary investment in bombers has shrunk almost beyond visibility;
- all bomber production programs have been capped and terminated;
- all Congressional efforts to initiate new bomber production programs have been actively opposed;
- the Air Force has consciously excluded any new, future bomber type from both the FYDP and the ten year plan; and
- there is no plan of any kind to replace the bomber capabilities being lost by any other means.

The bomber force is aging, shrinking from attrition, and glaringly absent from future R&D and procurement plans. With no funding, no modernization plan, and no evident concern for their absence, the bomber force faces inevitable extinction. Whether by active choice or default, this evidence means that the DoD has indeed made the fundamental strategic choice to rely in the future almost exclusively on short-range fighter aviation. Unfortunately, emerging trends in the security environment identified by the Pentagon would seem to call for a renewed emphasis on long-range air power.

III. The Bomber Force in the New Security Environment

During the Cold War, long-range heavy bombers proved to be vitally important assets to U.S. national security. Not only did these aircraft support nuclear deterrence as part of the "triad" of nuclear forces, but their flexibility also allowed them to also conduct conventional bombing missions in three separate conflicts (Korea, Vietnam, and Desert Storm). We believe that modern long-range bombers will be of increasing value in the coming decades. Many of the reasons are spelled out in the recent Quadrennial Defense Review (QDR), which provides a useful overview of the future security environment and national military strategy.

Through 2015, the QDR postulates that the United States will face a variety of regional dangers and "foremost amongst these is the threat of coercion and large-scale, cross border aggression against U.S. allies and friends in key regions by hostile states with significant military power." Beyond 2015, a "near-peer" global competitor could also emerge.

The QDR posits that three elements--shaping, responding, and preparing--define U.S. defense strategy. But boiled down to essentials, the QDR observed that the "primary purpose of U.S. forces is to deter and defeat the threat of organized violence against the United States and its interests." If deterrence fails, "the high end of the crisis continuum is fighting and winning major theater wars. This mission is the most stressing requirement for the U.S. military."

The QDR offered a strong rationale for the need to deal with two near simultaneous regional conflicts. And in fighting such wars, the QDR strategy stated that two aspects deserved special attention--1) stopping the enemy advance as quickly as possible; and 2) dealing with the "likely conditions" that future wars will involve "the threat or use of chemical and biological weapons (CBW)...including in the early stages of war to disrupt U.S. operations and logistics."[1] Forces best able to halt aggressors armed with weapons of mass destruction, then, should logically enjoy highest priority.

We would add that forces capable of executing this operation independent of theater bases and under conditions of surprise would be of even greater value. A range of powerful foreign and economic pressures will inevitably cause a further contraction in the U.S. overseas basing infrastructure and forward-based force levels. Indeed, planners should also assume that we will be taken by surprise in future conflicts; this was highlighted in the 1993 Bottom Up Review and is the recommendation of all analysts who have studied surprise attack in any detail. The wisdom of such a policy can be seen in the 1990 invasion of Kuwait and the two recent crises with Iraq (October 1994 and September 1996), all of which took us by surprise. The lessons from the two more recent crises are particularly relevant.

In 1994, Iraq rapidly mobilized forces near the frontier with Kuwait. Despite intensive intelligence focus on Iraq since the Gulf War, we not only failed to recognize this buildup early on, but also were unable to deploy sufficient forces until well after Iraq was in a strong position to attack. According to the Joint Chiefs of Staff, the United States and its allies faced at least a 2-3 day "window of vulnerability" through which Iraq could have invaded Kuwait and possibly threatened the Saudi oil fields.

In September of 1996, Iraq mobilized forces in its northern areas and pressed an attack into the Kurdish "safe haven." Once again we taken by surprise. Worse yet, for various reasons all members of the Gulf War Coalition denied immediate access to their bases for combat operations against Iraq, leaving our land-based fighters on the scene without suitable bases from which to strike the invading force. Carrier-based fighters located in the Gulf apparently did not possess the range to reach the scene of combat and the lack of stealthy carrier-based assets raised survivability concerns. In the end, we were reduced to largely symbolic strikes against Iraqi air defenses in the south using ill-suited cruise missiles launched from ships and B-52 bombers. Iraq was free to do as it wished in the north.

The lessons of these two crises in combination with the evolving security context reveal that bombers are ideally suited for the new era. They are the only force element capable of stopping surprise enemy aggression while operating outside the range of theater weapons of mass destruction. They do not require bases in the immediate combat theater (which also has the benefit of minimizing the number of Americans placed at risk). Finally, as explained below, bombers, though expensive when viewed on a per-unit basis, are extremely cost-effective compared to other force elements.

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[1] William S. Cohen, iReport of the Quadrennial Defense Review,i May 1997, p. 13.

Bombers like the B-52, B-1B, and B-2 typically feature unrefueled ranges and payloads 5-10 times greater than fighters. Long range is a vital attribute for the new security era. Long range allows bombers to respond more rapidly than any other force element--from the CONUS if necessary--in the case of surprise aggression. Long range provides strategic agility; bombers can shift firepower from one theater to another. Long range also allows bombers to fight from beyond the range of adversary weapons, which will be of increasing importance as weapons of mass destruction proliferate. In the Gulf War, for example, Iraqi missiles in development or service outranged all of our land-based and sea-based fighter aircraft (whose operating locations were thus at risk). And just as long range provides a sanctuary to the bomber force, it denies any sanctuary to the enemy, who cannot base assets outside the reach of bombers. Finally, long range also greatly expands the number of basing options available to the force should we wish to deploy the bomber force forward to signal resolve (and increase sortie rates). The longer the range, the greater the number of potential bases that are available, and the greater the number of countries available for negotiating access to bases.

The large payload of bombers allows a small number of aircraft to assume a disproportionate amount of the warfighting burden. In Vietnam, for example, the bomber force comprised on average only 7 percent of the force and delivered 44% of the bomb tonnage. In the Gulf War, the B-52 force only represented 4% of the force, but delivered 32% of the bomb tonnage (more than twice as much as the entire carrier force combined).

Previously, a primary virtue of these massive bomber payloads was their shattering psychological effect on enemy forces; in the Gulf War, for example, General Schwarzkopf drew on his Vietnam experience with B-52 strikes to demand that Iraqi forces be exposed to the same kinds of heavy bombardments which had proven so devastating to North Vietnamese forces. In future wars, the advent of precision weapons will allow bombers to accurately strike many different targets on a single sortie, which dramatically increases the bomber's value to the warfighting commander. The Gulf War illustrated the revolution afforded by precision, which increases air power's lethality by several orders of magnitude compared to unguided weapons.

In an era of declining budgets, the nation must procure the most cost-effective weapons possible. The ability to deliver large payloads of precision weapons makes each bomber sortie extremely effective; the low life-cycle cost of bombers (compared to other force elements) makes them extremely cost-effective. Bombers are very expensive weapon systems; producing a new B-2 costs about $1 billion, roughly the cost of a DDG-51 destroyer. But like warships, bombers enjoy long useful service lives and can operate effectively for three decades or more; the initial investment in the force is thus spread over many more years than most other systems. In addition, bombers are not people-intensive to operate. Personnel costs are typically a driving force in determining life-cycle costs for military forces. The annual personnel costs of a B-2 wing are about half that of a fighter wing and substantially less than that of an aircraft carrier or division. Overall, a B-2 wing's 35 year life-cycle cost (that is, total personnel, operations, and procurement cost) is

about the same as a fighter wing; about 1/3 that of an aircraft carrier battle group; and about 1/4 that of a heavy division.[2]

Personnel issues are related to casualty considerations, which typically play a critical role in crisis decision-making (and accordingly should also play an equally important role in determining what sorts of forces the nation should invest in). Bombers from this standpoint also are very attractive assets, since they only place a small number of people in harm's way. For example, deploying a wing of fighters to a theater base can put 2,500 people or more at risk; a carrier battle group up to 10,000 people; a division 15,000 or more. Each member of these units is at risk to attack by enemy weapons. A chemical warhead delivered by a ballistic missile against a theater airbase or deployed division has the potential to kill thousands; as would a strike by a sea-skimming cruise missile against an aircraft carrier. In contrast, the 1,300 personnel associated with a bomber wing would typically be operating from bases well beyond the strike range of an adversary, thus exposing the lives of the aircrew only.

In this same light we should also recognize the nuclear capability of the bomber force. If American theater forces were to be attacked by weapons of mass destruction - and particularly if they were attacked by nuclear weapons - there are compelling reasons why the United States might have to reply in kind. Bombers are the weapon of choice for nuclear response because the weapons remain under strict human control up to the very moment of launch near the target, and because the variable payload of the bomber gives it the widest possible variety of weapon delivery options. Moreover, since strategic arms control with the former Soviet Union and with Russia strictly limits the size of our nuclear arsenal, bombers could be used in counter-strikes without depleting our far more limited, single-use ICBM and SLBM assets. Inasmuch as our plans must hedge against the eventual emergence of a "near-peer" competitor, preservation of our remaining nuclear forces is a relevant consideration. Looking to the longer term, and understanding that no other nuclear-capable delivery systems are in production or planned, the bomber's dual capability (both conventional and nuclear) would allow a strengthened bomber force to sustain the nation's nuclear capability as other nuclear force elements inevitably age and retire.[3]

Overall, bombers appear uniquely well-suited to satisfy America's strategic requirements in the future security environment.

IV. Specific Advantages of the B-2

In looking at the bomber force, we need to discuss one additional, but revolutionary characteristic that the B-2 brings to the bomber force: stealth. Stealth shrinks the effective detection distance of a variety of sensors, particularly radar, and the basic physics involved in this set of technologies argues against the development of effective affordable counters. The B-2 thus combines four key characteristics--range, payload, stealth, and precision--in one platform. Range, payload, and

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[2] See Charles Perry, et. al, *Long-Range Bombers and the Role of Airpower in the New Century*, Institute for Foreign Policy Analysis, 1995, p. 57.

[3] An expanded version of the "nuclear argument for bombers" can be found in Stephen Cambone and Colin S. Gray, "The Role of Nuclear Forces in U.S. National Security Strategy: Implications of the B-2 Bomber," *Comparative Strategy*, 15:207-231, 1996.

precision allow a single B-2 sortie to strike with the effectiveness of multiple fighter sorties; stealth opens the door to a military revolution.

The traditional operational style that we have developed for the employment of air power relies upon large force packages to suppress enemy air defenses and shoot down enemy fighters. Stealth reduces the need for such support packages, which has a number of important effects. First, it greatly increases the cost-effectiveness of stealth platforms. Analysis conducted for the Commission on Roles and Missions (CORM) showed that the 42 F-117 sorties (which combined both stealth and precision capabilities) flown on the opening night of the Gulf War were almost equivalent in terms of target coverage *to the rest of the land-based air-strike forces combined.*[4] Another way to look at this is that each F-117 sortie was worth 16 non-stealth sorties.[5] The Air Force illustrated this same point after the Gulf War by showing that one or two B-2s can do the job of 60 fighters and 15 tankers.[6] This greatly reduces the costs of executing the mission; according to CORM analysis of the Air Force data, a B-2 would be seven times more cost-effective than the 75-aircraft force package.[7]

Stealth enables appropriately configured B-2s the potential to operate autonomously, which places this aircraft in a totally different category than the B-52 and B-1B. These older bombers must be supported with theater-based fighters until enemy air defenses are eliminated or equipped with expensive cruise missiles that can be fired from outside the range of enemy air defenses. Dependence on land-based fighters makes the non-stealthy bombers dependent on the United States gaining base access in a timely manner and raises a whole host of political and operational constraints. Cruise missiles, though valuable, suffer from a variety of operational constraints (targeting flexibility, ability to deal with relocatable targets, warhead size, etc.) and are too expensive to rely on to fight a sustained conflict (the conventional Air Launched Cruise Missile carried by the B-52 force, for example, is over 100 times more expensive than a Joint Direct Attack Munition delivered by a B-2).

This autonomous capability puts the B-2 in an entirely new class as of weapon system. It is truly the nation's only "modern" bomber and the nation's only global precision strike asset. *Indeed, we believe that the B-2 has the potential to revolutionize this nation's very approach to strategy making and force structuring.* As General Michael Loh, then the commander of Air Combat Command, stated in late 1994: "I see the B-2 as the centerpiece of an emerging national security strategy that places increasing importance on projecting immediate, responsive power from the U.S. to a regional crisis anywhere in the world. The B-2's qualities of range, payload, stealth, and sense of immediacy are uniquely applicable to be the centerpiece of this strategy."

A substantial force of B-2s would allow the United States to project overwhelming and decisive power against any adversary anywhere on the planet. To put matters in perspective, the addition of one more B-2 squadron (8 operational aircraft) would

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[4] *Future Bomber Force*, Commission on Roles and Missions, 1995, p. 3.
[5] Ibid.
[6] "The Value of Stealth," Headquarters, United States Air Force, 1991.
[7] See *Future Bomber Force*, Commission on Roles and Missions, 1995, p. 11.

give the B-2 force sufficient punch to strike the same number of aimpoints as those targeted by over 1,200 combat aircraft over the first 24 hours of the Gulf War. Clearly, procuring even greater numbers would open up new strategic avenues. As former Air Force Secretary Dr. Donald Rice has written, such a force would "allow the nation to seize this rarest of opportunities: a revolutionary leap in military capability, and with it, long term global military pre-eminence--American style."[8] No nation could confidently launch an armored assault on its neighbors. No dictator could think that his most prized strategic assets were immune to attack. No target would be more than a few hours away from attack. No defense could be counted on to protect key targets. In response to heightened tensions, the mere possession of a substantial force of B-2s could provide a new way to manage crises. Instead of going through the complex and risky steps of gaining base access, deploying forces, and escalating tensions, the President could simply order B-2s in the United States to be placed on higher alert. Even under the prevailing conditions of surprise and base access denial, a substantial force of B-2s could have made an enormous difference in the Iraq crises of 1994 and 1996.

The first job of the American military is to provide our political leadership with tools for deterrence and coercion so the nation does not need to fight wars. Preventing wars is far superior to fighting wars. A substantial force of B-2s would have a unique conventional deterrent capability. As two noted scholars of deterrence have written:

> "If U.S. national military strategy is designed with regional deterrence in mind, forward presence and/or rapid crisis response become key elements in this strategy...Optimally, this...means stationing all the forces necessary between the adversary and his objective, but even the United States lacks the resources to meet such a requirement in more than a few cases simultaneously. Therefore, strong incentive exists for the United States to explore capabilities that...are so rapidly deployable into an area as to be 'virtually' stationed there."[9]

This is the potential capability offered by the B-2. And that is the potential vision that the Pentagon is turning its back on by making the fundamental strategic choice to rely on short-range fighter aviation.

V. Why does the Pentagon oppose Additional B-2s?

If additional B-2 bombers could make such a revolutionary contribution, why does the Pentagon oppose them? Basic principles of bureaucratic politics go far in explaining the Pentagon's position. We believe there is such strong opposition to the B-2 precisely because it is so revolutionary--because supporting the B-2 would imply far reaching changes in core organizational interests, such as manpower, budget, roles, missions, and autonomy. It is helpful to begin with the perspective of the service that developed the B-2.

The B-2 is an Air Force system and one might imagine that the Air Force would be predisposed to support its continued production and improvement. The opposite is true. In any large bureaucracy, interests and programs tend to be identified with a particular organizational entity or bureaucracy. Historically, Strategic Air Command

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[8] Donald B. Rice, "To B-2 or not B-2, That is the Question," *The Washington Times*, November 5, 1995.
[9] Ken Watman and Dean Wilkening, *Regional Deterrence Strategies*, RAND, 1995.

(SAC) was the heart and strength of bomber advocacy in the Air Force. Through the 1960s and into the 1970s, SAC influence in the Air Force was very strong, and bombers often received a large fraction of Air Force R&D and procurement budgets. Accordingly, "bomber generals" often held top service positions.

When SAC and Tactical Air Command (TAC) were nominally "merged" into Air Combat Command in 1992, it was in reality much more akin to a hostile corporate takeover: TAC absorbed SAC. With the dissolution of SAC, the institutional foundation for bombers disintegrated. Consequently, bomber advocacy within the Air Force has virtually collapsed, and no funds have been budgeted to support any major new bomber program. Furthermore, as in the corporate world, management personnel from the losing entity discovered that they had little power. In the words of retired Air Force General Chuck Horner, bomber-oriented officers have been "funneled out of the Air Force."[10] Today the top service positions are typically held by "fighter generals," with hardly a bomber general to be found.

The roots of "fighter" opposition to the bomber force are complex. First, many officers with predominantly fighter backgrounds simply do not believe that the B-2 can perform as advertised. Having served all their lives in an Air Force where bombers were basically old, vulnerable and obsolete, they find it difficult to accept that the B-2 is different--that it can truly penetrate safely through defenses, or that it can strike targets at least as accurately as fighters. Their skepticism is reinforced by intense personal attachment to fighters and fighter operations. At a time when the Air Force budget has been in decline for more than a decade and so many fighters are on the verge of retirement, accepting the B-2 revolution might in their minds mean cutting fighter procurement programs. It might also mean accepting an entirely new approach to warfare in which the fighter sometimes might not even be relevant, let alone the dominant air instrument. Thus the number of fighter aircraft, fighter squadrons and wings--ultimately fighter pilots could be substantially reduced.

It is crucial to understand that USAF "fighter opposition" to the B-2 is well meaning. Everyone, Air Force officers included, have a powerful human tendency to trust in what they know, in what they have invested their careers, and in what has worked in the past. For the current Air Force leadership, this means a strong predisposition to trust in fighters.

The failure of the bomber revolution to succeed in the Air Force precluded any possibility of wider acceptance in the Pentagon. The inevitable consequence of an expanded role for bombers is an expanded bomber budget, and the new funds could come only by diversion from other existing military accounts. More bluntly, for bombers to receive increased funding, the non-bomber Air Force, the Army, the Navy, and the Marines believe they may have to accept less. If the Air Force has not yet accepted changes in air power strategy implicit in the B-2, how much more would the Navy and Army refuse the even greater changes which a revolutionary bomber force would mean for broader national military strategy, and hence for their budgets?

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[10] Charles Horner, "Unmatched Survivability," *The Washington Times*, June 13, 1995.

The Army continues to maintain its traditional view that the decisive battles of any war are fought on the ground. Victory is achieved through mass troop deployments and close-in engagements, with the Air Force providing "support." If the Air Force doesn't believe in long-range strike, arguing instead for the importance of air superiority and the primacy of air-to-air platforms, one certainly can not expect the Army to believe that air power has become the decisive combat arm (with the army providing "support" in consolidating the victory). An Air Force dedicated to air superiority and strikes near the forward edge of battle will remain dedicated to supporting the army.

In like manner, the Navy continues to believe that "presence" is an irreducible Navy mission, and that carriers will generally be first on the scene and first to fight in any theater conflict. The Navy has no reason to relinquish this view so long as the Air Force insists on making war with fighter assets that take weeks to months to deploy, and so long as the bomber force is so small and feeble that it provides no meaningful alternative for performing "carrier missions." And the Navy is right. Unless the Air Force builds more bombers and changes its strategy, the Navy must continue to have full responsibility for fulfilling all of its traditional missions.

Seen from this perspective there is in fact an inter-service consensus on which to resist the B-2 revolution. An Air Force that believes in applying air power using short-range fighters must have forward access, forward basing, and extensive logistical support. This in turn requires a massive ground presence, and inherently perpetuates a ground-warfare strategy. It also requires a massive sea-borne logistical tail, inherently perpetuating traditional navy views on sea control and sea power.

Overall the bomber force and the B-2 in particular has suffered from two major problems. First, it has lost any institutional, bureaucratic advocate with the demise of Strategic Air Command. Support for the B-2 means that something else must suffer--and no institutional champion or leader has emerged to lead that struggle. Second, support for the B-2 inherently means recognition of a revolutionary new form of warfare which threatens all other services and non-bomber interest groups. Affirming the B-2 ultimately implies major changes in strategy, in service budget shares, in service size and manpower, and in strongly held personal convictions. United Pentagon opposition to the B-2 is thus perfectly understandable.

VI. The Pentagon Studies

Understanding the institutional resistance to the B-2 within the Pentagon helps shed light on the recommendations of three studies recently conducted by the DoD on the B-2. These studies were not done willingly. The triggering event was congressional legislation in 1994 mandating that the Pentagon prepare an evaluation of the adequacy of the nation's bomber force. This action resulted in the three DoD studies that are evaluated below: 1) the DoD's 1995 Heavy Bomber Force Study; 2) the 1995 Heavy Bomber Industrial Capabilities Study; and 3) the 1997 Quadrennial Defense Review's study of the B-2 issue. In addition, we examined one additional study conducted by the staff of the Commission on Roles and Missions (CORM), entitled *Future Bomber Force.*

In examining the DoD studies, we would like to emphasize two points. First, the studies studiously ignored the fundamental strategic choice at hand: should we maintain a bomber force or go to a force structure based primarily on short-range air power? Second, in formulating scenario and modeling assumptions (which inherently drive study outcomes) the analysts had to go to extreme lengths to ensure that study results supported the status quo and recommend against additional B-2s.

Our overall assessment of the DoD studies is that Pentagon politics took precedence over analytical objectivity and national security concerns. The basic problem with the Pentagon studies is that they fly in the face of common sense. The following seems to be an appropriate analogy for the current situation. We must plan to face an adversary armed with a sawed off shotgun (a metaphor for weapons of mass destruction). Given a choice between a short-range pistols and long-range rifles, the Pentagon studies try to argue that pistols are preferable, even though this choice requires that we move within shotgun range to shoot the adversary. We believe that striking the enemy promptly and accurately from a distance is the better choice in many scenarios, particularly since it appears the long-range option is cheaper over the long term.

The 1995 Heavy Bomber Force Study and its industrial base counterpart were carefully constructed to come up with the desired answer (no additional B-2s required). The CORM bomber study came up with the wrong answer (additional B-2s are very attractive) and was quietly shuffled aside. The 1997 study initially came up with the wrong answer (additional B-2s was the most cost-effective option available), and was reshaped to provide the desired answer (no more B-2s required).

The 1995 Heavy Bomber Study

The 1995 Heavy Bomber Study was conducted by the OSD, the Joint Staff, and the Institute for Defense Analyses.[11] Following its chilly reception in Congress, the Department has so far proven reluctant to publish a final scripted report of the study. As noted by Dr. Glenn Buchan, a distinguished and experienced bomber analyst at the RAND Corporation,

> "The fundamental problem with the heavy bomber study is...whoever framed the study cooked the books. They allowed a set of assumptions that led to a preordained outcome by essentially ruling out all the things that would have led them to other results."[12]

Buchan also noted that once the assumptions were laid out,

> "one could have concluded in somewhere between 30 seconds and, perhaps if one were very careful and thoughtful, two or three minutes, how this was going to come

[11] For a detailed assessment, see Kurt Guthe, *A Precisely Guided Analytic Bomb: The Defense Department's Heavy Bomber Study*, National Institute for Public Policy, September 1996.

[12] Testimony to Military Procurement Subcommittee, House National Security Committee, September 12, 1996.

out, not necessarily having to go through all the computer runs and all the analysis."[13]

The Heavy Bomber Study assumed the following scenario as its base case. The United States would receive approximately two weeks of strategic warning. Acting immediately on this warning, the United States would have these two weeks to deploy large numbers of fighters and aircraft carriers to the theater (without encountering any base access or logistical support problems). The enemy, having watched and waited as the U.S. deployed overwhelming force into the theater (at unprecedented rates) would then attack anyway. American fighters would then fly at sortie rates far beyond those achieved during the Gulf War to defeat these enemy forces.

To the thousands of fighters in combat, the analysts then added 20 additional B-2s to planned bomber force (for a total of 40 B-2s). Using a land war simulation, the analysts then assessed the impact of the additional B-2s (which were flown at *lower* sortie rates than that achieved by B-52s in the Gulf War) on the overall campaign. In other words, the capabilities of 20 B-2s, an approximately $25 billion investment over the next two decades, were compared to those of a force structure costing about $5 trillion over the same period. As Dr. Paul Kaminksi, the study leader, observed in his briefing: "...we have ten times more tactical aircraft than bombers...After everything has arrived, the bomber results get lost in the overall aggregate."[14]

The conclusion of the study was that the planned bomber force could meet all demands "for anticipated scenarios and reasonable excursions." But testimony revealed that the excursions were carefully scripted. For example, one scenario was supposed to look at the effects of a no tactical air power case--that is, if we encountered difficulties in deploying fighters or were concerned that an adversary might strike our bases or carriers with weapons of mass destruction. But it was revealed in testimony that through some unexplained development, a wing of fighters were always assumed present to support B-52 and B-1B bombers. What would happen if those fighters weren't there? This case, dismissed as "unreasonable", was never considered.

Moreover, results that showed the B-2 in a favorable light were never considered in the decision-making process. For example, in testimony to the Senate Armed Services Committee, Senator Sam Nunn asked Dr. Kaminski about the likely results if the U.S. was taken by surprise and theater access was a problem. Kaminski replied: "Then I am going to need a lot more bombers than I have in the current force." But this conclusion was never incorporated into the study recommendations.

The second major conclusion of the study was that it would be more cost-effective to invest in additional munitions, not additional B-2s, since additional weapons increased overall force effectiveness. This is an odd argument. By the same logic, one could argue that it would make more sense to invest in jet fuel stocks rather

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[13] Cited in Kurt Guthe, *A Precisely Guided Analytic Bomb: The Defense Department's Heavy Bomber Study*, National Institute for Public Policy, September 1996, p. 41.
[14] DoD Special Briefing, May 1995.

than fighter aircraft, since sufficient jet fuel is needed to make the force more effective.

What the study should have looked at was how an additional buy of B-2s compared to buys of other planned force elements. But this is something the Pentagon resisted. Simply discussing the tradeoffs ended up causing such internal friction in the Pentagon that the topic was removed from the study. An unbiased analysis would quickly illustrate the B-2's superior cost-effectiveness compared to other planned (and preferred) force elements--and thus would throw the careful balance of interests in the Department into disarray.

The 1995 Bomber Industrial Capabilities Study

The Bomber Industrial Capabilities Study was directed by Congress, chartered by the DoD, and conducted by The Analytic Sciences Corporation (TASC). The study concluded that additional B-2 production was not necessary to maintain the bomber industrial base because, with enough time and money, we could eventually recreate the capability to build B-2s in the future.

Eliminating time and money from consideration avoids the dominant real world issues. Obviously, with enough time and money, we can recreate anything. The real question is: *how much* time and money compared to the option under consideration by Congress--continued production. On that question, the industrial base study was entirely silent.

Although used to validate the decision against more B-2s, the TASC industrial study provides critical strategic data. The dominant Pentagon argument against the B-2 is affordability. Yet their own industrial study estimates that building a new bomber type, a B-3, could easily cost in excess of $35 billion for research and development alone (with unit flyaway costs about the same as a B-2) and raised questions about the affordability of such a program. If building more B-2s--with research and design already complete--is too expensive, then certainly the cost of a B-3 is prohibitive. Deciding against B-2 production is therefore a de facto decision against any future bomber production. It is a strategic decision to abandon the bomber force.

The Quadrennial Defense Review and the 1997 B-2 Study

Congress clearly had little confidence in the preceding Pentagon analyses, and in 1995 appropriated funds to resume B-2 production. In February 1996, President Clinton ordered these funds spent on bringing the original test B-2 (Air Vehicle 1) up to operational configuration. In addition, and at Congress' behest, he ordered the Pentagon to once again re-examine the B-2 issue. This time, the Pentagon was to compare the B-2's cost-effectiveness to that of other deep attack systems. The absence of such a cost-effectiveness comparison was widely viewed by critics as one of the 1995 Heavy Bomber Study's major failings.

The Pentagon, though receiving this direction in February 1996, conducted no specific B-2 analysis until March 1997. Over the space of several weeks, analysts from the Joint Staff, OSD, and the Institute for Defense Analyses--the same group that conducted the 1995 bomber force study--ran their computer models and

developed a summary briefing. The analytic results of this study obviously caused alarm bells among the Pentagon hierarchy. *Simply put, the results showed that B-2s were more cost-effective than any other force element.*

Before proceeding further, let us examine the analysis. Four scenarios were developed: a two conflict scenario with warning (allowing time for deployment), a similar scenario with short warning, a similar scenario with short warning and base-access problems; and a two conflict scenario with warning where one of the conflicts featured a "near peer" competitor.

The Pentagon then assumed the immediate retirement of the following forces:

- 2 fighter wings (plus 10% of Marine air)
- 4 fighter wings (plus 20 % respectively of Marine air)
- 2 carriers and their air wings (though not the entire battle group)
- 3 carriers and their air wings
- All the B-1Bs

With the funds freed up by these individual retirements over the next 20 years, the study then looked at how many B-2s could be purchased. In general, retiring a carrier would allow the purchase of 12-14 B-2s; a fighter wing about 8-12 B-2s.

Using a complex computer simulation, the analysts then looked at how many B-2s were needed to replace the various retired force elements in each of the four scenarios. *In almost every case, savings enabled more B-2s to be purchased than were required to replace the retired systems' military capability in the conflict scenarios. In other words, B-2s proved more cost-effective than the planned forces.*

These were not the desired answers. *What the analysis showed in general was that very small numbers of B-2s could potentially replace large groups of planned—and thus preferred—forces (such as the entire B-1B fleet).* And the cost of those B-2s was substantially less than the forces they were replacing. In the wrong hands, these results could be used to argue that a B-2-based force structure could support U.S. national security at lower budget levels--exactly what had been predicted by B-2 supporters in Congress after the Heavy Bomber Study debacle. Accordingly, arguments were developed to counter these results.

One tactic was to break up the warfighting results into two phases: 1) the halt phase; and 2) the counter-offensive. The halt phase--the period during which U.S. forces would stop an enemy offensive--was highlighted by the QDR strategy as being extremely crucial and the results once again showed the B-2s cost-effectiveness; very few B-2s were needed to replace carriers, fighters, or B-1Bs. For the counter-offensive (that is, the period when our ground forces had built up and had launched an offensive after months of aerial bombardment), the analysts calculated the number of weapons each force element could deliver compared to a cost-equivalent number of B-2s. These results showed that the other forces would be able to deliver more weapons in a given period of time (unlike the fighter forces, however, the B-2s were not allowed to deploy forward to increase their sortie rates).

But the counter-offensive results really showed how carefully the metrics had to be arranged to achieve the desired outcome. Weapons delivery potential *after* we have stopped the enemy advance, destroyed his army, ripped apart his strategic infrastructure, chopped up his lines of communication, attacked his leadership, and destroyed his air force and air defenses, hardly matters. The issue of winning or losing is no longer in doubt. Assuming performance in the counter-offensive to be as important as in the halt phase contradicts the QDR strategy that presents the halt phase as being absolutely vital to meeting national security objectives. In addition, if the analysis had used ton-miles as a metric instead of just tons, the B-2 would have proven superior. Ton-miles, which is calculated by taking tons of weapons delivered times miles flown, is a useful measure because it incorporates the important metric of range.

However, the most revealing illustration of the Pentagon's orchestration of the results was found in the "capability gap" charts, which emerged as the centerpiece of the arguments used against the B-2 since the quantitative results had proven so problematic. Here, the Pentagon claimed that retiring a single aircraft carrier, for example, would greatly reduce the nation's capability to do drug interdiction, peace enforcement, anti-ship warfare, and sea control, among others. Similar claims were made for the retirement of fighter wings. This line of argument raises more questions than it answers. First, the "capabilities" were completely undefined and the B-2s unjustifiably excluded as potential contributors. Why couldn't the B-2s contribute to some of these missions? For example, B-2s could destroy drug manufacturing facilities with precision bombs, provide sea surveillance, or fire anti-shipping missiles to assist in sea control. Second, it is unclear that a small reduction in the total force would have any effect on these missions. Indeed, but a small fraction of the force would be required to fly a few "drug interdiction" missions. Third, and most important, the missions selected are hardly core missions. What is more important, conducting drug interdiction or preventing the seizure of the Persian Gulf oil fields? What the Pentagon was trying to obfuscate was the fact that the B-2 was more cost-effective than the planned forces in fighting major theater wars. And that was an unacceptable answer.

The clearest illustration of the bias inherent in the 1997 study can be found in a closer examination of the "capability gap" issue. Specifically, not a single chart was dedicated to highlighting the capabilities currently missing from the current and planned force that would be generated by expanding the B-2 fleet. For example, we currently cannot halt a large-scale armored assault without tactical air forces in-theater prior to the outbreak of hostilities. How do we plan to so in the case of a surprise attack? How do we plan on deploying forces in the face of chemical and biological attack--something the QDR says should be assumed? How do we plan on conducting a large-scale pre-emptive strike against an adversary's facilities for producing weapons of mass destruction? How do we plan on striking facilities that lie outside fighter range, such as terrorist camps in northwestern Iran? Nowhere in the briefing are the advantages of an expanded B-2 fleet articulated, much less highlighted. How could the Pentagon advertise this as an unbiased analysis if no consideration was ever given to the formidable advantages offered by the B-2? The lack of such consideration is the clearest evidence that the Pentagon planners preferred to stay rooted in the concepts and force structures of the past--and not consider the future.

The 1995 CORM Bomber Study

In 1994 legislation, the Congress also appointed a Commission on Roles and Missions (CORM). As one of their tasks, the CORM was asked to provide an opinion on the size of the B-2 force. The CORM sidestepped this issue in their final report--only stating that if one believed the assumptions of the Heavy Bomber Force Study study, one could believe its conclusions. But what the CORM staff did conduct was a most interesting study—primarily, it seems, because it was performed outside of the DOD's influence. *Future Bomber Force*, however, was filed away until published by the Air Force Association in 1996.

Future Bomber Force offered a fresh view of the B-2 issue. It was the only government study to provide empirical insights into the value of stealth technology. Like the QDR's quantitative results, it showed that B-2s were the most cost-effective weapon system available when compared to other preferred forces. However, it did so using simple "spreadsheet" calculations instead of complex computer simulations. Most significantly, *Future Bomber Force* was the only bomber study to show a grasp of the revolutionary potential offered by the B-2. Listed below is its "Summary of Findings":

> "The synergy of advanced munitions with the range and payload of long-range bombers may be more important to the Department of Defense in the years ahead than at any time during the Cold War. Combined with the stealth of the B-2, precision munitions with long-range bombers have the potential to provide key capabilities not available from any other forces to meet critical future national security requirements. Specifically, these capabilities include:
>
> 1) The potential to halt an armored force in a matter of days from long-range
> 2) The ability to survivably operate against an enemy from beyond reach of enemy weapons (particularly missiles armed with weapons of mass destruction)
> 3) Guaranteed responsiveness--independent from forward basing or carrier pre-positioning
> 4) The ability to achieve strategic or operational surprise quickly, imposing wide-spread attack and paralysis upon an aggressor with minimum exposure of friendly personnel
> 5) The ability to swing survivable and effective force from one MRC to another rapidly
> 6) The psychological impact of strike without notice
> 7) The ability to induce enough uncertainty in a potential aggressor to deter hostile activity conventionally while the U.S. in militarily engaged elsewhere
> 8) Greatly reduced support assets, personnel, and basing requirements to achieve equivalent effects with non-stealth and/or smaller payload, shorter range aircraft."

VII. Conclusions and Recommendations

Our review of the bomber issue concludes that current plans for the long-range air power force are woefully deficient. We believe that the nation's long-range air power capabilities will be more important in the future than they have been in the past. Indeed, the changing shape of the security environment makes long-range air power ideally suited to the protection of American security interests in the decades ahead. Moreover, we believe that proper exploitation of the B-2 could radically change the way in which we think about and employ military power, leading ultimately to a much more affordable and effective military posture.

The only option for maintaining the viability of the bomber force over the long term is to continue production of the B-2 stealth bomber. Our review of the DoD's studies indicates that the B-2 issue has become so captive to Pentagon bureaucratic politics that the Department has made the wrong strategic choice. By following the DoD's recommendations, the bomber force itself becomes a wasted asset. The nation will be abandoning a weapon system that is becoming very cost-effective as precision weapons are introduced. This capability will become increasingly vital to supporting U.S. national security in this very challenging new era. This is not the way to conduct rational national security decision-making. By allowing organizational politics and short-term affordability concerns to dominate the B-2 debate, we will turn our backs on the future. Moreover, we will risk U.S. national security interests and the lives of thousands of young Americans.

We believe Pentagon opposition will eventually ameliorate once military planners gain greater appreciation of the advantages offered by the B-2. But until that time, the future of the bomber force and this revolutionary weapon system lies with Congress. The situation is similar to that of the F-117 in the 1980s. The Air Force insisted that a single squadron of these revolutionary aircraft was all that was needed; Congress directed a doubling of the buy, an action that saved many American and allied lives in the Gulf War.[15] Today, once again, only Congress can set in motion the steps needed to maintain production of the B-2.

Additional B-2s are affordable within planned budgets. The Pentagon plans to increase procurement spending approximately 50% by 2001 and those funds should be spent on the most cost-effective systems, such as additional B-2s. We make the following recommendations:

- Fund at a minimum one additional B-2 squadron (9 aircraft), but keep open the possibility of increasing the production rate and planned force size;
- Direct the Department of Defense to develop and provide to the Congress a five-year procurement plan that contains a full funding plan for one additional squadron of B-2s;
- Hold a hearing to assess whether to re-establish an operational command in the Air Force dedicated to long-range strike, headed by a four star general, who can ensure that bomber issues are given appropriate consideration in national security decision-making.

The fundamental strategic choice is up to you in Congress. An enhanced bomber force centered on a larger B-2 fleet could make revolutionary contributions to our national security. We urge you to take the steps necessary to make sure that the opportunity afforded by the B-2--a better, more effective, and more affordable military--becomes reality.

[15] Donald B. Rice, "To B-2 or not B-2, That is the Question," *The Washington Times*, November 5, 1995.